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## Total Quality Leadership and Productivity Gain Sharing: A Case of Conflict or Compatibility?

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**TOTAL QUALITY LEADERSHIP AND PRODUCTIVITY GAIN SHARING:  
A CASE OF CONFLICT OR COMPATIBILITY**

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13. ABSTRACT (Maximum 200 words) Several Navy organizations have combined elements of Total Quality Leadership (TQL) and Productivity Gain Sharing (PGS). The purpose of this report is to compare these approaches and to identify the mutually supportive relationship between TQL and PGS. The general concepts underlying TQL and PGS are: (1) an open-systems perspective, (2) the clarification of management responsibilities, (3) changes in organizational structure, and (4) a focus on measurement. It is suggested that TQL and PGS should not be considered as two separate approaches, but rather as part of the same management system.				
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## FOREWORD

This report describes a way to integrate Total Quality Leadership (TQL) and Productivity Gain Sharing (PGS) into a single management system. TQL has been accepted in the Department of Defense as the best way for improving quality and productivity and thereby reducing costs.

Implementing TQL generally requires extensive organizational change. The authors as well as other TQL researchers have often encountered difficulty in organizations accepting the changes required for TQL to be most effective. PGS is entirely consistent with TQL. Of greater importance, PGS as a management strategy can supplement and strengthen the successful implementation of TQL.

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## SUMMARY

The federal government has recognized the need to direct efforts to establish, improve, and maintain quality. Many government organizations have engaged in total quality leadership (TQL) activities. The need to establish, develop, and tie quality related activities to employee incentives has also been recognized. Agencies are being encouraged to initiate non-traditional motivation procedures, such as productivity gain sharing (PGS) to improve productivity and quality. At present, several Navy organizations have combined elements of both TQL and PGS. The purpose of this paper is to compare these approaches and to identify the mutually supportive relationship between TQL and PGS.

TQL is often perceived solely as an approach that stresses improvement of work processes through the application of certain statistical tools. PGS is often perceived solely as a financial incentive system. Neither of these views is entirely accurate. Both are richer in scope and consist of theory-based and applied orientations. Most of the concepts underlying TQL and PGS are the same. General categories derived from these approaches are: (1) an open-systems perspective, (2) management responsibilities, (3) organizational structure components, and (4) measurement issues. Both approaches view the organization as an open-system which requires the company to proactively interact with its external environment (customers and suppliers) in order to modify its internal environment to meet changing requirements. Both TQL and PGS, in their most "successful" forms, require extensive behavioral and resource support from all levels of management. Structural changes, regarding internal communication, employee involvement, and long term planning are required if quality and productivity are to improve. And, at the heart of an effective and successful TQL and PGS effort, is an accurate and credible measurement system.

An important difference between TQL and PGS is in the area of motivation. This may be the issue causing the most perceived conflict between TQL and PGS. While financial incentives are minimized or rejected by TQL proponents, they are part of the basis of PGS. Despite these apparent differences, several Navy organizations have recently successfully combined both TQL and PGS. (Note: TQL does reject the use of allocating financial compensation on an individual basis, i.e., if someone wins, another loses, but *not* if everyone gains equally, such as in group rewards).

TQL and PGS should not be considered as two separate approaches, but as part of the same management system. The goals, values, and objectives of these approaches are similar. PGS can be described as an elaboration of TQL, as a way of reinforcing TQL principles. If PGS, for example is presented separately, as part of a new productivity or quality effort, it may be perceived as competing for resources with TQL and then both efforts are likely to suffer.

The organizational implementation of TQL and PGS require cultural changes. Culture is reflected in the myriad of activities and beliefs that govern organizational life. How decisions are made, how conflicts are resolved, how careers are developed, how well change and innovation are supported, all indicate aspects of organizational culture. Modifications are generally slow in coming while the status quo is typically reinforced and supported. However, by consistently reinforcing specific attitudes, values, and behaviors, managers directly and relatively quickly communicate the type of culture they desire. Thus, when it is desired that the organizational culture should reflect TQL values, the likelihood will be increased that the preferred behaviors and processes will be implemented when combined with PGS.

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## INTRODUCTION

Anemic productivity growth is the primary economic problem facing the United States today (Thurow, 1987). Both private industry and the government are searching for ways to improve productivity and quality. Prior to 1967, the average annual rate of productivity was 3.2 percent. Between 1977 and 1982, the annual average productivity growth rate averaged 0.6 percent for the United States. The annual productivity growth rates for competitor nations were substantially higher during this same period: 3.6 percent for Italy, 3.4 percent for Japan, 2.7 percent for the United Kingdom, and 2.1 percent for West Germany (Hill, Hitt, & Hoskisson, 1988).

The concern with improving productivity has been strongly emphasized by the federal government. Unless productivity improves, it will be impossible to maintain our defensive strength and readiness without lowering our standard of living. President Reagan signed Executive Order 12552 in February 1986 that aimed to improve productivity in government organizations. This focus was reiterated in Executive Order 12637 signed in April 1988. These documents require the development and implementation of plans designed to continuously improve productivity. These efforts are particularly significant because of increasingly tighter and restrictive budgetary conditions.

Public and private sector organizations in the United States have undertaken a variety of macro and micro level efforts to reverse reduced competitiveness and make more effective use of resources. Such efforts traditionally have included new capital investments, improved labor-management relations, reduced government regulations, revitalizing and restructuring corporate management, increased emphasis on manufacturing strategy, and more recently emphasized increased innovation, productivity and quality initiatives.

In addition to a productivity growth rate that has been below that of many of our global competitors, many U.S. workers have complained that their skills and abilities have not been adequately used in their jobs (Quinn & Staines, 1979). Declining productivity improvement rates combined with the inadequate use of human resources indicate that organizations may not be effectively structured and managed (Tuttle, 1981). Improving technology is often identified as the remedy for the present state of economic woes. But contemporary Japan, which serves as an economic model for many countries, has not been a technological pioneer in any area. A primary reason for its economic rise has been because of its leadership in management; the systematic integration of a set of management values and procedures, technological advances, and effective application of human resources (Drucker, 1988).

The challenge, for American industry and government, is to identify the optimal relationships between management, technological, and human resource innovations that will lead to significant economic improvements. A variety of approaches to improve productivity and quality have been discussed, scrutinized, implemented, and revised by a growing number of public and private sector organizations over the last several years (Metz, 1984; Wiley & Campbell, 1986). These approaches range from very specific and programmatic organizational changes, such as quality circles, zero defects, and value engineering, to broader focused change efforts. These latter approaches modify, restructure, or redesign the organization through efforts such as employee involvement, team building, incentive systems, process control, and total quality management.

The purpose of this paper is to compare two approaches that are presently receiving much attention throughout the Department of Defense in general, and more specifically the Department of the Navy. These approaches are Total Quality Leadership (TQL) and

Productivity Gain Sharing (PGS). Many managers perceive that TQL and PGS are mutually exclusive systems. However, we will show that TQL and PGS are not only compatible, but mutually supportive. Integrating these approaches will strengthen their successful implementation and application. In addition to discussing the relationship between TQL and PGS and their principal elements, guidelines for their implementation will also be presented.

## **QUALITY AND PRODUCTIVITY**

What do we mean when we talk about quality and productivity? Many definitions of quality abound in the popular literature. By way of convention, we have chosen to focus on elements common to the many definitions of quality. Three primary aspects emerge: (1) concern with the customer's desires, (2) the specific product or service provided, and (3) the comparison of the product or service to the product or service provided by competitors-including price (Shetty, 1986). Productivity has been generally defined as the relationship between the outputs and inputs of an organization. Outputs are the goods and services an organization provides. The inputs include such things as labor, capital, materials, and energy costs. In the private-sector, productivity is often viewed as the ratio of sales to the costs of production. In the public-sector, productivity may be reflected in the timeliness, effectiveness, and efficiency of the product or service.

Until recently, American business policies and practices supported the position that productivity and quality were incompatible (Deming, 1981, 1982). If you emphasize productivity, quality will suffer, and if you focus on quality, productivity will be curtailed. The success of America's global competitors has changed that perception to the extent that productivity is hardly mentioned anymore without considering quality as well (Lowe, 1986; Shetty & Buehler, 1987). Similarly, the federal government's initial efforts focused on the implementation of productivity management activities. While this is still a major thrust today, a greater emphasis has been placed on quality management. A transformation has occurred in the government to such an extent that quality and productivity have been given parity in federal improvement efforts (Burstein & Sedlak, 1988).

The need to stimulate and increase long-term productivity growth has led to a strategy, within the federal government and in many private-sector organizations, to pursue the improvement of quality as a mechanism for improving productivity. In order to improve quality, the process by which a product or service is produced needs to be improved. Process improvement increases the uniformity of product and service output while reducing output errors, such as defects and inefficiencies associated with resources such as materials, personnel, and equipment. These improvements reduce waste and direct work efforts to be more efficiently and effectively focused on the production of desirable goods and services. Thus, quality enhances productivity, leads to lower costs, and generates additional business. "The benefits of better quality through improvement of the process are thus not just better quality, and the long-range improvement of market-position that goes along with it, but greater productivity and much better profit as well. Improved morale of the work force is another gain: they now see that management is making some effort themselves, and not blaming all faults on the production-workers" (Deming, 1981, p.13).

## **QUALITY IMPROVEMENT THROUGH TOTAL QUALITY MANAGEMENT**

The basis for recognizing the importance of improving quality as a key for improving productivity comes from the works of three important "quality gurus": Philip B. Crosby, W. Edwards Deming, and Joseph M. Juran. Each of these experts proposes a specific approach for improving quality. While many differences exist between these orientations, such as the methods by which the respective approaches are implemented, there are also many similarities.



The present report is not intended to compare and contrast these approaches. It will, however, discuss general concepts that are similar across these varied approaches.

TQL reflects a management philosophy that requires adopting an organization-wide perspective. It fosters the development of an organizational culture that values continuous improvement. Management has the major responsibility for providing an environment that will allow improvements to occur, not just for the short-run, but for the long-term as well. This approach requires strategic planning and the development of organizational expectations. Some of the factors that contribute to this environment, or culture, of continuous improvement are (a) support for better communication vertically and horizontally, (b) clearly specifying and identifying ways to achieve organizational goals, (c) support for education and training opportunities, (d) and encouraging employee involvement.

A list of the most important elements of TQL is shown in Table 1. We grouped these elements into several general categories that appear to capture the basic underlying structures of both TQL and PGS systems. These categories are (a) an open systems perspective, (b) management responsibilities, (c) organizational structure, and (d) measurement.

**Table 1**

**ELEMENTS OF TOTAL QUALITY LEADERSHIP**

**OPEN SYSTEMS PERSPECTIVE**

CONTINUOUS QUALITY IMPROVEMENT  
CUSTOMER DRIVEN  
PROCESS VARIATION  
RELATIONS WITH SUPPLIERS

**MANAGEMENT RESPONSIBILITIES**

MANAGEMENT INVOLVEMENT--LEADERSHIP  
EDUCATION AND TRAINING  
PROACTIVE, DATA-BASED DECISION MAKING

**ORGANIZATIONAL STRUCTURE**

CONSTANCY OF PURPOSE  
STRATEGIC PLANNING  
COMMUNICATION IMPROVEMENTS  
TEAMWORK  
EMPLOYEE INVOLVEMENT

**MEASUREMENT**

PROCESS IMPROVEMENT TOOLS  
FEEDBACK  
COST SAVINGS  
EVALUATION

## Open Systems Perspective

The TQL perspective views organizations as open and dynamic systems; systems that need to continuously interact with their environment in order to survive. Raw materials are imported from the environment, transformed within the internal environment of the organization, and exported back to the external environment in the form of goods and/or services. This follows an input-transformation-output model. The organization must be ready to adapt to environmental demands, such as product obsolescence, changes in the economy, new legislation, changes in the workforce, and the development of new technology. An organization must be aware of these and other environmental factors if it is to optimize the way it functions. The elements that are important for this category include an emphasis on the continuous pursuit of quality, customers, recognition that variation occurs in all processes, and the role of suppliers.

**Continuous Process Improvement.** The unique features of TQL approaches consist of (a) the primary focus on quality (rather than on productivity per se) and (b) the systematic analysis and correction of work processes. This emphasis requires a change from the traditional "error detection" processes in which most organizations operate, to one of "error prevention." The problem with the traditional approach is that the product is completed or the service is delivered before an error is identified. This often occurs with little understanding of where the error occurred or how to prevent such errors from occurring in the future. Such a procedure results in wasted resources because the cost of producing an acceptable item is more expensive than producing an acceptable one. The product or service with the error must be either reworked or discarded and a substitute provided.

The "prevention" approach consists of monitoring the process of production in a systematic way and on a continuous basis. Using a variety of measurement procedures, problems can be identified at their source and adjustments made to prevent additional errors from occurring. It should be noted that this procedure for in-process assessment should not serve as a universal substitute for end-product inspection. End-product inspection may be a useful and necessary requirement for some products and services. In-process assessment shows the appropriateness of how the process operates. If errors or defects occur, they can be corrected immediately. However, this procedure does not distinguish between acceptable and unacceptable end-products (Siegel, 1982).

**Customer Driven.** A top priority for TQL is the identification and satisfaction of customer requirements. Albrecht and Zemke (1985) suggest that if organizations are to establish and maintain their competitiveness they must provide what the customer wants. In order to do so, organizations must realize that customer demands are "progressive," that is, they keep changing (Albrecht & Zemke, 1985). A requirement at one time may be relatively unimportant at another time. Further, after having attained the desired levels of accomplishment, new criteria, standards, expectations, or requirements may develop. Establishing the value of continuous improvement may lead to innovations that will lead to better products and/or services.

Ishikawa (1985) emphasized that an organization, if it is to compete, must insure that it provides the "true quality characteristic," that is, giving the customer what he/she is expecting. This particular focus suggests that an organization must develop, not only a culture that promotes close contact with customers but also, a systematic, long range business perspective that maintains interaction with the customer. This requires establishing an organizational mechanism that insures that customer requirements are periodically obtained, evaluated, incorporated, and reassessed.

**Process Variation.** Another unique feature of TQL recognizes that variation is part of any process. There will be differences between the quality of specific products and services.

However, this variation, from some expected level, must not necessarily be assumed to be a "problem" that requires immediate change. Present variation needs to be compared to past variation. Only with this comparison can it be determined whether the results are due to normal or expected variation of the present system, or due to something unusual (that requires immediate action). Further, while variation is considered part of any process, TQL recognizes the need to reduce this variation but based on a set of comparable data. The contribution of process variation for TQL is the realization that differences occur, yet they may not all require specific changes to the system.

**Relations with Suppliers.** As part of the interaction with the environment, the raw materials that are transformed need to be considered as well. Much of the quality of the final product or service is dependent on the quality of material received from the supplier. Relationships need to be developed between the organization and the suppliers to receive materials of acceptable quality. Reduction in variation of the raw materials is a requirement for the organization. Suppliers are also influenced by changes in the external environment, such as by economic and technological changes. Deming (1986) emphasizes the need to develop a long-term relationship based on trust and loyalty with vendors.

### **Management Responsibilities**

TQL tasks top management with the primary responsibility of providing an environment that will allow and encourage process improvements to take place. This tasking serves to establish the organization's culture. This is not an easy part of the philosophy to fulfill because it requires active participation by management, not simply the typical verbal support given for "another program." Elements of this category include active managerial involvement and leadership behavior in support of TQL, continuous education and training, and the use of systematically collected data as the basis for long-term decision-making.

**Involvement/Leadership.** Management must initiate quality and productivity improvements themselves. It won't occur among the workforce on its own. Management must provide behavioral examples of their commitment to TQL. This can be done in many ways, such as by allocating resources, making process changes, providing education and training, and talking with employees.

Leadership is also best established by setting examples of desired behaviors. Leaders are those who improve the system by talking and listening to and learning from employees. They serve as coaches and are able to convince others of the importance of the required changes. Managers serve as the initiators of change.

**Education and Training.** An important component of TQL is insuring that employees continually be allowed to acquire the new knowledge and skills that are required to deal with new material, methods, and technology. Such activities reflect an organization's long-term investment in its employees. Such activities help to lay foundations for innovativeness that may be needed for the company to remain competitive.

**Proactive, Data-Based Decisions.** Management has the further responsibility to base organizational decisions on data, not just on opinions or status within the company. They need to actively seek answers to questions and to assess results in light of company requirements. When changes are made, the effects or impact of these changes also need to be assessed and modified if indicated by new data.

## **Organizational Structure**

Structural changes to the way the organization is run are needed if the implementation of TQL is expected to have long-term effects. These changes begin with systemic changes that allow the implementation of process improvements to occur. Among the important elements for the organizational structure is a mission statement that specifies the company's purpose. Further, the specific ways to accomplish this mission need to be developed in the form of long term strategic plans. Also, efforts should be undertaken to improve communication, elicit employee involvement in making improvements, and establishing teamwork as the basis for improving quality and productivity.

**Constancy of Purpose.** The long-term survival of a company is helped if a declaration of organizational purpose and direction is developed and followed. Most often this commitment can be issued in the form of a mission statement.

**Strategic Planning.** Stating a commitment to long-term survival is meaningless unless there is a plan that specifies how this is to be accomplished. Not only is it necessary to identify where the company would like to be and what it would like to accomplish in the future, it is also necessary to identify what must be done in order for them to be achieved. This is the purpose of strategic planning.

**Improve Communications.** A way of improving communications is to proactively take steps to remove the barriers that typify most hierarchical organizations. Most organizations are based on functional relationships. This structure encourages allegiances to particular departments and their functions, often to the exclusion of the final end-product or service that is received by the customer. One way of reducing this problem is to establish a structure that consists of interdependent or cross-functional teams with primary responsibility to a quality output. The operation of the team is focused on improving the end result, not specific departmental requirements. Communication needs to improve vertically and horizontally.

**Teamwork.** Working as part of a team is a way of improving communication. An organizational structure that promotes teamwork, according to TQL, will facilitate cooperation, communication, and process improvements. Harmful, intra-organizational conflict will be reduced.

**Employee Involvement.** One of the best ways to identify how work processes can be improved is through employee involvement. Individuals who are engaged in the daily work production process, undoubtedly know how to improve quality better than anyone else. If lasting process improvements are to be made, these employees need to play an active role in identifying and implementing beneficial changes. Not only will feasible improvements be surfaced, but employees are likely to experience more identification with the company and have more control over what they do on the job.

## **Measurement**

Measurement or a way to determine whether quality and quantity improvements are occurring is a key part of the development of a TQL system. Such an approach includes the systematic collection of relevant data, summarizing them, and using them to make decisions that will improve quality. This requires the development of an accurate and credible measurement system. Whether using statistical process control, problem-solving techniques, the Shewhart Cycle, or one of the various planning procedures, information is gathered as a basis for decision-making. This information is also used to provide feedback to employees so they will know where problems exist and how to correct them. Subsequent changes are subject to continuous

measurement and evaluation in order to determine the effectiveness of the changes and to compare them to cost savings.

**Process Improvement Tools.** Statistical tools provide the objectivity and accuracy needed to obtain process information. The appropriate use of these tools can aid in improving work processes and reducing errors. It must be remembered that the techniques used are just tools; their purpose must be understood in order to be used appropriately.

**Feedback.** Measurement also provides non-evaluative feedback. Employees often do not receive information on how well they are performing until an inspection (usually downstream), until performance review time, or not at all. Maintaining measures of work processes serves multiple purposes. In addition to being able to monitor process performance, employees also receive information on their own and their group's performance. This information can serve as a basis for identifying what is being done well and also to identify the needed training or skills that will help to improve quality.

**Cost Savings.** A unique feature of TQL is the push to improve the quality of products and/or services by improving their processes. In so doing, costs play an important role. Ishikawa (1985) states that cost control is part of quality control. If improvements in process quality do not correspondingly reduce costs and/or improve market shares, pricing, and profits, then process quality has not been achieved. "No matter how high the quality, if the product is overpriced it cannot gain customer satisfaction...one cannot define quality without considering price" (Ishikawa, 1985, p. 45). Crosby (1979) focuses on the "cost of quality," expenses associated with producing defects. He states that the cost of sales increases faster than prices. Therefore, in order to make a profit, costs need to be reduced. The best way to reduce costs is to prevent defects from occurring. Thus, not only is quality "free", but profits are correspondingly higher. Throughout his writings, Deming also clearly specifies a concern with providing the highest quality, reliable uniformity and dependability, at the lowest costs.

**Evaluation.** TQL supports the continuous monitoring and evaluation of work processes. After improvements have been made, processes still need to be measured and monitored in order to detect changes that may negatively affect the work process. This evaluation can also be used to continue to improve work processes. This is a crucial element because it conveys an organizational culture that continuously strives for perfection based on previously implemented successful improvements. This adds to the viability and survivability of the organization.

## **PRODUCTIVITY IMPROVEMENT THROUGH PRODUCTIVITY GAIN SHARING**

A variety of financial and non-financial approaches have been investigated by both public and private sector organizations attempting to improve productivity. These approaches have included gain sharing, stock options, bonuses, promotions, zero defects, value-engineering, cost reductions, job enrichment, quality circles, autonomy, recognition, and employee participation and involvement. While each of them has resulted in some success, not enough data are available to make reliable comparisons. Rather than comparing and contrasting one approach with another it will be more fruitful to focus on an orientation that combines aspects of financial and non-financial determinants of motivation that lead to increased productivity. A frequent problem however, exists in that some managers do not feel it appropriate to use financial incentives as a means of motivating employees to increase their productivity.

Usilaner (1981) and others (Government Accounting Office, 1981) report a National Science Foundation study on the relationship between motivation and productivity. They found that financial reward and recognition for effective performance were the principal factors in establishing highly productive and satisfied employees. The Institute for Survey Research (ISR) at the University of Michigan, however, reported that job enrichment and job enlargement were

more valued by employees than was money (1981). Fein (1982) reanalyzed the ISR data by occupational types (executives, professionals, technicians, clericals, salespeople, factory workers, truck drivers, and farm workers). He found that only professionals and managers placed a higher priority on "interesting work" than on money. The other occupations, however, indicated that monetary incentives were the strongest motivators for improving performance. Others (Locke, Feren, McCaleb, Shaw, & Denny, 1979) also found that money was a stronger motivator than participation. Combinations of the two, however, money and participation, led to higher levels of performance (Hamner & Foster, 1975). Clearly, although some may disagree with the power of its impact or the ethics of using money as a reward, financial incentives, especially in combination with non-financial ones, have been shown to positively impact performance.

An approach that combines aspects of both financial and non-financial incentives is productivity gain sharing (PGS). PGS consists of an approach that requires management to focus the attention of every employee on ways to improve productivity in the organization. Many gain sharing plans solicit employee involvement to make improvements in labor, capital, materials, and energy. The financial gains resulting from these improvements are then shared with the employees according to some predetermined formula. The three major gain sharing approaches are the Scanlon, Rucker, and Improshare Plans. While it is beyond the scope of the present paper to provide an analysis of the relative merits of each type of plan, elements of the Department of Defense (DoD) supported PGS approaches (Department of Defense, 1985; Johnson & Fisher, 1989) are shown in Table 2.

**Table 2**

**ELEMENTS OF PRODUCTIVITY GAIN SHARING**

**OPEN SYSTEMS PERSPECTIVE**

CONTINUOUS PRODUCTIVITY IMPROVEMENT  
CUSTOMER INVOLVEMENT

**MANAGEMENT RESPONSIBILITIES**

LEADERSHIP  
EDUCATION AND TRAINING  
DATA-BASED DECISION MAKING

**ORGANIZATIONAL STRUCTURE**

MISSION DRIVEN  
LONG-TERM PERSPECTIVE--STRATEGIC PLANNING  
COMMUNICATION  
TEAMWORK  
EMPLOYEE INVOLVEMENT

**MEASUREMENT**

PRODUCTIVITY MEASUREMENT  
GROUP BASED INCENTIVES-FINANCIAL BONUSES  
GAIN SHARING FORMULA  
FEEDBACK  
COST SAVINGS

## **Open Systems Perspective**

In practice, gain sharing plans vary depending on a specific organization's needs, requirements, and interactions with its environment. The organizations that most successfully implement PGS are those that adapt the basic principles to their particular circumstances (Miller & Schuster, 1987).

The three most widely known gain sharing plans are Scanlon, Rucker, and Improshare Plans. Scanlon Plans are the most employee involving and use a bonus formula based on the relationship between sales and labor costs. Rucker Plans generally are less employee involving than Scanlon Plans, and base their bonus formula on added value, that is, sales minus the costs of labor and material. Improshare Plans generally do not include employee involvement and use a bonus formula based on engineered standards and total labor hours. The heart of the DoD-supported gain sharing approach strongly supports employee involvement and allows the specific bonus formula to be determined by individual organizations.

**Continuous Productivity Improvement.** PGS emphasizes continuous improvement, specifically focusing on productivity. All of the major PGS plans have as their primary goal the improvement of productivity. Since productivity is defined as the ratio between inputs and outputs, improvements can be made in a variety of ways: (1) decreasing inputs, outputs stay the same, (2) decreasing inputs while increasing outputs, (3) decreasing inputs at a faster rate than outputs are decreased, (4) increasing outputs while inputs stay the same, and (5) increasing outputs at a faster rate than inputs are increased.

**Customer Involvement.** In order to insure continual sales to customers, their needs and concerns must be monitored. While most of the basic PGS plans provide limited discussion of customer involvement, DoD plans have incorporated requirements for maintaining contact with customers.

## **Management Responsibilities**

In PGS, management is seen as the key to providing the leadership to facilitate productivity improvements (Doyle, 1982).

**Leadership.** All of the major PGS plans specify important roles for management. Managers are usually given responsibility for PGS coordination and facilitation, serving on various screening committees, evaluation of ideas, and calculation of the bonuses. In this regard, selected managers should be highly credible and visible. Management provides the direction and organization for the company.

Management must demonstrate that they believe in PGS principles by changing their management styles to reflect these beliefs. For example, they must be receptive to employee ideas and criticism. They must be willing to share information with employees, and to respond honestly to questions (Miller & Schuster, 1987). Further, union/management relationships must change by encouraging more trust and cooperation.

**Education and Training.** To effectively use improvement information, the workforce must be familiar with the latest technology and state-of-the-art information in technical areas. Management has the responsibility to provide their employees the best information and skills development it can afford. Employees also need to be informed of the implications of PGS for their organization. They need to be "taught" the foundation of PGS as well as how it would be applied in their organization. How employees consequently respond will be a key input for management's decision about continuing with PGS.

**Data Based Decisions.** Although not emphasized to the extent found in TQL, data-based decision making is an essential ingredient of any PGS system. One of the major goals of PGS is to pursue a numerical index reflective of productivity improvement. This index serves as a guide for identifying organizational areas where improvements have occurred as well as identifying those areas requiring additional assistance to facilitate process improvements. This information is also used as a basis for determining the bonuses that can be distributed.

## **Organizational Structure**

Doyle (1982) indicated that a necessary tasking under PGS is the establishment of an organizational structure that will allow its objectives to be met. Within this framework, it must be understood that the PGS plan selected should be entirely specific to its own environment. However, there are certain philosophical commitments around which changes to the structure must be framed. Some of these values include developing long-term strategic plans for organizational survival and ways to increase communication, participation, coordination, cooperation, and performance.

**Mission-Driven.** An organization needs to have a clear, concise statement of purpose and direction. The specification of an organizational mission provides for the formulation and implementation of the company's strategic plan (Pearce, 1982). This important tool provides managers with a unitary purpose and direction that transcends transitory environmental demands. It helps define the ultimate aims of the organization by integrating features and requirements of the external environment (customers, suppliers, competitors) with those of the internal environment (employees).

**Long-Term Perspective--Strategic Planning.** PGS plans are not "quick fixes" (Miller & Schuster, 1987). The commitment to designing and implementing gain sharing plans require the development of a focused organizational strategy. This necessitates establishing an environment where strategic planning is an integrated part of the way the business functions. This perspective lays out the specific ways that organizational goals will be met. The flexibility of such a system allows organizational changes to be made as environmental conditions change, usually with enough lead time to reduce the potentially devastating effects of sudden crises and fire-fighting.

**Communication.** One of the biggest failures of PGS in the past has been a lack of communication between management and non-management employees (Lawler, 1981). Direct and open communication is needed if employees are to understand and accept the fact that their pay will increase if organizational productivity improves. Management needs to engage in activities that promote this emphasis on communication. Not only does this focus on communication lead to increased trust within the organization, by providing an opportunity for employees to express improvement ideas, but also for employees to know that these ideas will be seriously considered by management. PGS formalizes the establishment of a partnership between management and non-management. This requires both managers and non-managers to communicate more effectively with each other as organizational decisions and processes of performance are brought into greater focus. If management does not suggest effective two-way interaction and communication, the likelihood of a successful PGS effort will decrease.

**Teamwork.** Consistent with the employee involvement feature is the resultant focus on teamwork. PGS when applied across the entire organization reflects the concern that productivity improvements must occur for the company as a whole. Compensation and rewards are only distributed if this results. Individual competition, for a finite set of rewards, are eliminated. Working together in support of group or team success is what will lead to a sharing of bonuses. The intention behind this element is to strengthen cooperation, working together for common goals, and the sense of partnership in the enterprise.



**Employee Involvement.** PGS plans provide for various formal levels of employee involvement. This provision consists of any structured method that provides performance feedback to employees and encourages them to identify and solve work-related problems. Scanlon Plans are the most formalized type of employee involvement plan. The DoD approach to PGS places a significant emphasis on employee involvement. The basic assumption of this approach is that when employees actively participate, productivity is more likely to be improved.

O'Dell (1981) claims that gain sharing plans without some mechanism for incorporating employee contributions will generally fail; any productivity changes that occur are not likely to last. Fein (1982), however, questions the use of employee participation and involvement. Gain sharing, in its most successful (long-term effects) form, is considered to be more of a management philosophy than a financial incentive plan; primarily because of the emphasis on employee involvement and attempts to improve working conditions and to address employee concerns (Usilaner, 1981). Even Fein (1982) has admitted that productivity sharing is not just an incentive plan, but rather it is a philosophy of managing. Under productivity sharing, worker productivity goals and management goals are mutually interdependent.

## **Measurement**

The fourth major category is measurement. If measurement criteria are not understood because of complexity, inadequate training, a lack of credibility, or inaccuracy, the PGS plan will be doomed to failure. The performance measurement system should be as simple as possible and reflect factors employees can influence, not things beyond their control. Typical measurement questions involve issues such as: (a) what measurements will be considered as inputs and outputs, (b) how will they be determined, (c) what will serve as comparisons for improvement, and (d) what formulas will be used to calculate savings and bonuses?

**Productivity Measurement.** The importance of this element is to identify verifiable indicators of improvement. These indicators will vary by organization, but they must reflect an agreed upon set of factors by members of the organization. For manufacturing organizations, these indicators may be relatively straightforward, while for research and development organizations it may be more difficult (but not impossible) to identify, agree upon, and measure how well the organization is performing.

**Group-Based Incentives.** A basic tenet of PGS is that productivity gains are to be shared between the company and the employees according to a pre-arranged split. A rationale for the way these gains are divided that is acceptable to both the organization and the employees is determined prior to the implementation of the gain sharing system. Bonuses are paid for performance improvements over a specified time period. The closer in time and more frequent the payments, the clearer and stronger the relationship between performance and the bonus. This bonus, from our perspective, should be based on group performance.

**Gain Sharing Bonus Formulas.** Each PGS plan has a unique formula for calculating productivity improvement. While Scanlon and Rucker formulas relate bonus earnings to financial performance, others have used measures of labor productivity. Financially based formulas provide a bonus when the company's financial performance has been enhanced by employee performance, regardless of productivity gains. Labor productivity formulas, on the other hand, provide a bonus when labor productivity has increased regardless of the firm's financial performance.

**Performance Feedback.** Within a PGS framework, employees are provided with information on company performance and productivity. This may be measured at the organizational level or down to the work group level of productivity. Nevertheless, employees

can see where they have improved and where additional improvement is needed. This latter aspect is crucial because employees can identify what specifically needs to be done.

**Cost Savings.** Lawler (1971) reports that PGS typically emphasizes cost savings rather than quantity of production. Increasing quantity alone, however, may lead to greater organizational costs. An example would be meeting schedule with many defective units that would need to be repaired at a later date. Thus, there is little, if anything, to be shared among employees. However, with a focus on cost savings, employees are likely to identify the processes and procedures that will lead to the greatest improvements and thus result in a greater amount to be shared.

**Evaluation.** The DoD approaches typically stress ongoing evaluation (at a minimum of once-a-year) of the PGS system. In this way, improvements can be incorporated when and where they are needed. This also allows for adaptation and flexibility due to market conditions, technology, or human resource considerations.

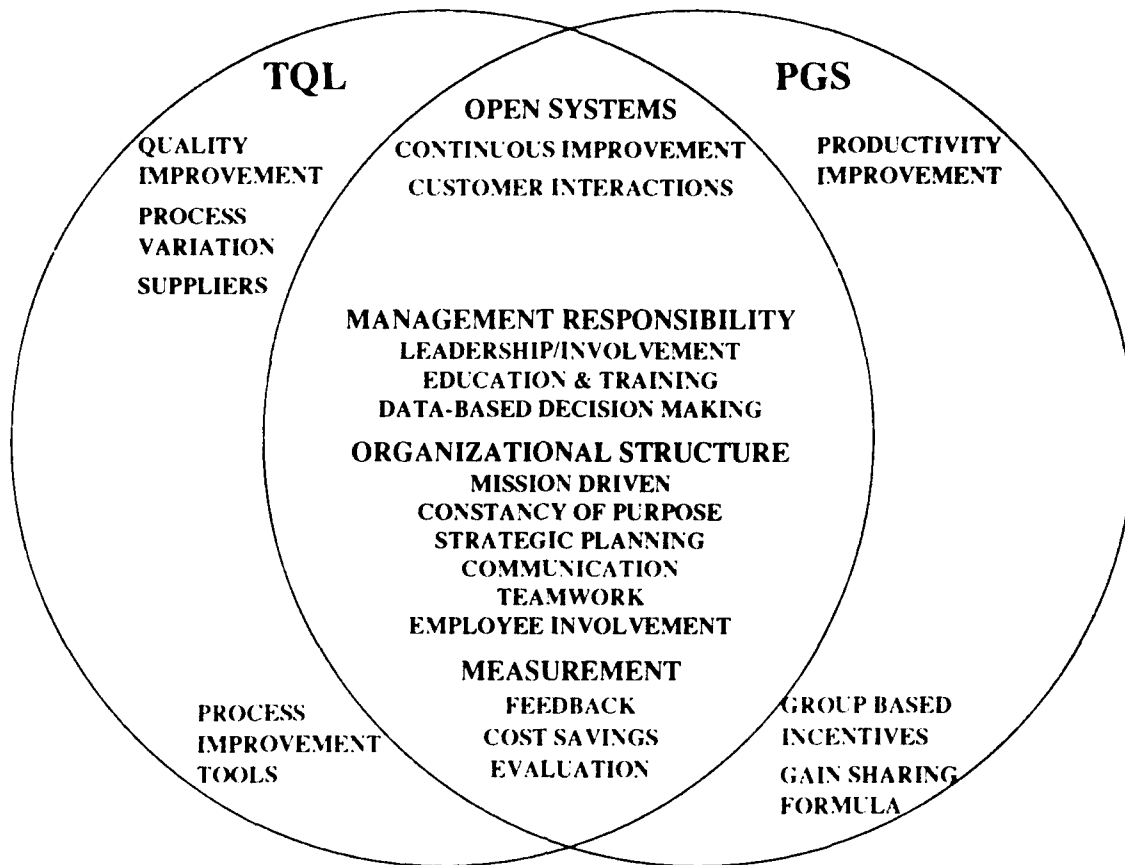
## RELATIONSHIP BETWEEN TQL AND PGS

In reviewing the principle components of TQL and PGS, many similarities are found. Suggestions that the two approaches are incompatible may have resulted from misunderstandings of TQL and/or PGS. TQL is often perceived as an approach that stresses improvement of work processes or quality through the application of statistical tools. Improvements to sustain and to maintain behaviors are said to result from employees "wanting to do a good job" ("pride of workmanship"). PGS is often thought of as *just* a financial incentive system that pays employees for increasing quantity. It is assumed that productivity improves primarily because employees "work harder." Neither of the above perceptions reflects an accurate understanding of TQL and PGS. Figure 1 shows the relationship between TQL and PGS. The overlap in the circles represents the common elements while the non-overlap reflects the unique contributions of each approach.

### Open Systems Perspective

Both TQL and PGS maintain an open-systems approach to operating and maintaining an organization. More information has been found in the literature on TQL regarding this aspect than on PGS, but both subscribe to these tenets. TQL places much more emphasis on external considerations, such as the importance of customer requirements and involvement with suppliers. While PGS does consider involvement with customers as important, there is less elaboration on this aspect than is typically described within TQL. In practice however, the organization must maintain an active role with customers if it is to remain competitive. Further, while PGS does describe organizations in terms of input-transformation-output, little is found in the literature discussing the role of suppliers (input). This is one area of the PGS literature which could use greater elaboration.

Both TQL and PGS are oriented toward continuous improvement. TQL, however, is based on improvement of quality. Productivity is essentially a by-product of improved quality. For PGS, productivity is the main focus. Quality is an attribute that can be included as a measure of productivity. Some PGS plans do not even directly include quality as a measure in their productivity formulas (Miller & Schuster, 1987). In many DoD PGS plans, the distinction between quality and productivity is not easy to make.



**Figure 1. The Relationship Between Total Quality Leadership (TQL)  
and Productivity Gain Sharing (PGS)**

The view is that being productive means that the product or service must be delivered on time, be of the right quantity, and must meet or exceed the customers' requirements.

As noted above, a unique feature of TQL is its treatment of process variation. TQL recognizes that variation is a part of any system, and that how this variation is managed depends on the cause of the variation (e.g, whether the variation is due to normal fluctuation or special circumstances).

### **Management Responsibilities**

Both TQL and PGS, in their most "successful" forms, require extensive behavioral and resource support from all levels of management. TQL is a management system that fosters top down leadership. The leaders must establish an organizational climate that addresses customers' requirements, seeks employee input and involvement, demands long-term accountability, provides necessary education and training, and makes decisions based on a particular methodology for collecting data.

PGS is generally viewed as an approach separate from its management component. Doyle (1982) reports that most organizations with little gain sharing exposure mainly see the bonus as 90 percent of the effort. The majority of questions are bonus-related. However, as

people experience gain sharing the emphasis shifts from personal gains to group or team progress and improvement. An orientation which focuses on common goals and accomplishments becomes the dominant operating force. Under this approach, management must also exhibit top-down leadership for PGS to be credible, accepted, and successfully implemented.

## **Organizational Structure**

TQL and PGS both require structural changes; moving away from an emphasis on implementing programs (with specific beginnings and ends) to ones that support systematic, long-term continuously improving organizational design. While traditional and on-going quality and productivity efforts should not be eliminated, they should be incorporated into the new system. These strategic changes are the same for both TQL and PGS and include an organization-wide focus, a clear statement of goals and objectives, employee involvement, management support and perceptions of ownership, improved communications both vertically and horizontally, and performance feedback.

Hawley (1982) suggested that a key to implementing changes that are crucial for organizational survival is motivating employees to accept them. TQL approaches do not discuss motivation other than to suggest that employees will generate their own internal motivation because of a desire to do a "good job." Self or intrinsic motivation is certainly an important factor, but it has not been shown to have long-term effects. Many practitioners, (Stonich, 1984; Kerr & Slocum, 1987) believe a mechanism is needed that will encourage managers and non-managers to behave in ways that support the organization's culture through its goals and structures. They believe that mechanism should be based on the organization's reward system. Many managers tend to disregard and disapprove of using rewards as motivational tools. However, it should be remembered that reward systems define the exchange relationship between the organization and the individual member. Such systems specify the behaviors and activities that the organization desires by providing employees with recognition (financial or non-financial). As such, a reward system promotes, supports, and reflects the organization's culture.

## **Measurement**

At the heart of an effective and successful TQL and PGS effort is the establishment of an accurate and credible measurement system. Both TQL and PGS emphasize improvements: improvements in quality, productivity, work processes, customer relationships, employee relationships, supplier requirements, and in many other phases of organizational structure and functioning. In order to improve, however, one must know the present level of organizational functioning. Thus, measurement serves not only as a means for collecting information of interest, but also as a means of comparison to some earlier level of performance or productivity. Sink, Tuttle, and DeVries (1984) strongly urge organizations to clearly specify their goals and how to best achieve those goals prior to the implementation of measurement. Without goal clarity and an understanding of how to accomplish those goals, measurement may have negative or dysfunctional effects on the organization. An organization might be collecting information and measuring factors that neither promote its goals and objectives nor specifically helps to manage it more efficiently and effectively.

Both TQL and PGS philosophies discuss the need for identifying clear goals and objectives ("constancy of purpose") and assessing the organization to determine whether it is achieving those goals and objectives. Measurement provides the link between the organization's strategic plan and the extent to which it is accomplishing its goals and objectives.

While both TQL and PGS emphasize the need for appropriate measures, caution must be advised with the implementation of any measurement system. Metz (1984) discusses the problems associated with over-measurement: measurement can become an end in itself. An organization can become so over-reliant on measurement that quality and productivity become secondary. When used inappropriately, measures serve to punish employees rather than as a tool for improvement. Such an application can be extremely threatening to employees and may lead to mistrust and result in inaccurate data (Tuttle and Sink, 1984). A key to the implementation and application of a measurement system for both TQL and PGS is to clearly identify the purpose for which the information is being collected and how it will be used.

Of course, PGS has a unique need for a measurement system that allows the organization to calculate productivity gains and determine bonuses and incentives. These measurement systems are not found in TQL. Because TQL places much importance on process variation and improvement, it has developed a set of process improvement tools not usually found in PGS.

## **HOW TQL AND PGS CAN WORK TOGETHER**

### **Motivation and Rewards**

An important difference between TQL and PGS is in the area of motivation. This is perhaps the issue causing the most perceived conflict between TQL and PGS. Further, financial incentives are minimized or completely rejected by many TQL proponents. These incentives are an important element of PGS, however. Despite apparent differences, several government organizations (especially in the Navy) recently have successfully combined both TQL and PGS.

Crosby, Deming, and Juran do not discuss "motivation" in a positive way. Motivation, to them, connotes artificial, transitory, and compliant responses typically associated with the use of posters, slogans, gimmicks, and fads. People's emotions may be positively affected temporarily, but no long-term behavioral commitments and improvements are made. Rather, to achieve long-term organizational improvements an organization must remove barriers, improve communications, and monitor and improve their work processes. While these considerations are all undeniably important, it is less clear how they can be maintained over time without some form of incentive or "motivation", be it financial or non-financial.

Behavioral theory and research suggest that activities that are reinforcing tend to be maintained (Hammer, 1988). If desired behaviors are associated with something that has been found to be reinforcing, such as bonuses, recognition, and/or increased responsibility, those behaviors will be strengthened and repeated. In other words, if an organization provides reinforcement or rewards for change, then it will occur. In this way, changes will be institutionalized easier than if no reinforcement was provided (Lawler, 1988).

One of the reasons given for the apparent negative implications of the use of financial reward systems is that employees generally perceive little or no relationship between pay and performance (Lawler, 1966). Frequently, the relationship between performing specific behaviors and the consequences of obtaining a pay incentive must be made explicit (Opsahl & Dunnette, 1966). Typically, pay has been shown to be more related to job level and seniority than performance, even in organizations that claim to have merit raises (Hamner & Foster, 1975).

Ishikawa (1985) recognizes that money has a strong effect on behavior. But he suggests that money, as the motivator, may lead to undesirable consequences, such as increases in

absenteeism (he cites U.S. examples for this). According to Ishikawa, more important motivators are satisfaction with doing a good job, cooperation and recognition, and personal growth (Ishikawa, 1985). Again, while these factors are important within the work situation, he fails to mention that many Japanese organizations base part of their compensation system on financial bonus systems that are tied to profitability.

Further, many managers feel that money will cause employees to lose interest in the intrinsic aspects of their jobs (Deci, 1971, 1972). For many managers, money is seen as a negative way of motivating employees. These managers believe that employees are, or at least should be, primarily motivated by the job itself. The job should be interesting in and of itself, it should provide for creativity, autonomy, and lead to perceptions of accomplishment that financial compensation does not provide (Deci, 1971, 1972). Many people believe that offering people money to do a job actually diminishes enjoyment and satisfaction with the job. Deming, for example, has claimed in his seminars that paying incentives to people destroys their pride of workmanship. However, this is taken from the perspective that rewards are distributed to some individuals and not to others. But group rewards, where everyone receives the same amount of bonus, serves to strengthen teamwork, cooperation, and communication.

For the most part, the evidence for intrinsic motivation is weak (Hamner & Foster, 1975; Scott, Farh, & Podsakoff, 1988). Financial incentive plans have been found to have very powerful effects on work performance (see Lawler, 1971, 1981; Locke et al. 1980), and when combined with participative management systems the combination leads to greater productivity than either one alone. Research shows that the effects of intrinsic non-monetary rewards, and extrinsic monetary rewards combine to improve performance without negatively affecting each other. Further, one of the reasons Scanlon plans have been successful is because they combine employee participation with the company's ability to provide a financial bonus.

Despite the apparent differences between TQL and PGS with regard to motivation and rewards, the two approaches do not work at cross purposes. Employees need to be motivated to insure the long-term success of any quality management system. PGS provides the extrinsic incentives that reinforce the intrinsic rewards that may result from TQL. Further, when equal bonuses are distributed to everyone, because of organizational improvements or profitability, pride of workmanship can only be increased.

### **The Importance of Strategic Management**

A recent magazine article reported that over 80 percent of the Fortune 500 companies have attempted to implement some type of quality and productivity effort (Bremer, 1988/89). Unfortunately, many of these efforts have not resulted in significant organizational improvements. One of the reasons for this lack of success is that these improvement attempts have not been linked to the company's strategic management practices. Improvement efforts are often viewed as separate from the strategic planning process. They are seen as additional programs to be tried. Such an approach will not usually be accepted by employees and can only lead to disappointment by management. Fortunately, the federal effort, and the Navy's effort in particular, has emphasized the importance of building an infrastructure in which TQL is the primary driving force within the organization (Burstein & Sedlak, 1988). This approach recognizes that TQL must become part of the strategic management process and will require cultural changes within most organizations. What many managers fail to realize is that a company's reward system can be especially powerful in influencing the corporate culture. This is how the effects of PGS can be combined with TQL to result in a quality and productivity improvement effort that will have long-term effects for an organization. Since PGS and TQL are similar in philosophy and application, sharing the gains provided by PGS should serve to reinforce the behaviors, attitudes, and values of TQL.

## **TQL and PGS as Complementary Systems**

TQL and PGS should be thought of as part of the same process. It is important that PGS be presented as an extension of TQL; as a way of supporting and reinforcing the TQL principles. As can be seen in Figure 1, there is considerable overlap between TQL and PGS. If PGS is presented as a new productivity or quality project or program, it may be perceived as competing with TQL and both are likely to be negatively affected. In many organizations, when several separate efforts have been implemented concurrently, employees often perceive them to be in competition with each other (Metz, 1984). If one program or effort is accepted, then the other one is typically discarded or ignored, especially if it is similar in scope. In the long run this limits the effectiveness of each effort. The interactive operating philosophies of TQL and PGS appear to provide the best avenues to develop and sustain commitment to quality and productivity. Specifically, they could achieve a system of checks-and-balances that focus organizational efforts on meeting customer requirements and providing consistently excellent products and services at the best prices available.

The federal government has recognized the need to direct efforts to establish, improve, and maintain quality. Burstein and Sedlak (1988) report the attempts of many government agencies to engage in TQL activities. While education and training are seen as crucial elements in the establishment of a quality guided culture, the need to establish, develop, and tie quality-related activities to employee incentives also has been recognized. Individual agencies are being encouraged to initiate non-traditional government motivation procedures, such as gain sharing, in an effort to increase behaviors consistent with productivity improvement (Burstein & Sedlak, 1988). At present, several Navy organizations have combined elements of TQL and PGS. Not only have they indicated that TQL and PGS are compatible, but they are complementary. Each approach has increased the likelihood of the other being successful.

## **SUCCESSFULLY INTEGRATING TQL AND PGS**

Companies that successfully implement quality and productivity improvement efforts realize they must be tailored to their own particular organizations. However, certain general considerations have been identified as most likely to lead to success. It should be noted that the conditions discussed below attempt to combine both TQL and PGS as a way of changing the organizational culture and improving quality and productivity.

1. **Open Systems:** Customer requirements and suppliers capabilities need to be understood. Customers include people both inside and outside the organization. An indication of the relationship of quality to TQL and PGS, is the extent to which the needs of the marketplace have been met. Quality characteristics are based on customer expectations. The need to maintain a relationship with customers is required in order to continuously monitor customer satisfaction and be able to respond to changes in requirements and demands.

2. **Management Responsibilities:** Top management must assume the role of the leaders and initiators of change. They have the primary responsibility to see that the workforce is educated and trained on the philosophy and methods of TQL and PGS; the goal of quality and productivity improvement needs to be a part of employee education, training, and motivation. All managers must be proactive in their approach and base their decisions on data rather than opinion, folklore, or appeals to "higher authority."

**3. Organizational Structure:** Top management must be committed to the improvement of product and service quality. This commitment must be clearly stated in the organization's goals, objectives, policies, and actions. Management's commitment is often best reflected in how they allocate resources to the improvement effort. The entire human resource effort, from recruitment, selection, orientation, evaluation, rewards, to education and training, must be oriented to improve quality and productivity.

The development of a mission statement and a strategic plan that clearly identifies goals of quality and productivity, and how to achieve them, such as through the interaction between TQL and PGS, needs to be communicated. Such a process will require input from employees. Employees must believe that quality improvements will be pursued and supported by the organization. Greater acceptance of the change effort will occur when employees realize they are being rewarded for engaging in behaviors for which the organization said they would be rewarded. Here also, the application of PGS will support TQL.

**4. Measurement:** The only way to know for sure if the organization is attaining its quality goals and objectives is through the measurement of the results. Measurement generally serves two purposes: (a) to identify how well you did, and (b) to serve as a basis for improvement. Measures can help set priorities, evaluate progress, initiate communication, develop corrective actions, and reward employees. Measurement must be clearly tied to the entire management process, such as strategic planning, education and planning, product and/or service results, setting goals and objectives, ties with customers, areas for improvement, budgeting, and resource allocation. The link between costs and quality improvements should be clear through the use of accurate data. Measures that quantify performance criteria and results make strategies and quality more understandable and acceptable. An organization's measurement system is the means by which both TQL and PGS become functional and credible.

## CONCLUSIONS

The implementation of TQL and PGS requires changes to an organization's culture. This is not an easy task. The development of an organization's attitudes, values, norms, and behaviors, all components of culture, may take years to develop. Culture is reflected in the myriad of details that reflect organizational life. How decisions are made, how conflict is resolved, how careers are developed, how change efforts are presented and supported, all indicate aspects of organizational culture. Modifications are generally slow in coming and the status quo is generally fostered. However, reward systems serve as mechanisms for managers to communicate the type of culture they desire, through reinforcing specific attitudes, values, and behaviors. The acceptance and application of TQL, as part of the culture of the organization is more likely to occur and be sustained when it is reinforced in combination with PGS.



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